XIAN YEOW LEE

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PROFESSIONAL SUMMARY

- Graduate research assistant with over 3 years of experience in deep learning and engineering
- Diversely trained to perform research in fundamental and applied machine learning problems
- Published 10 machine learning-related manuscripts in peer-reviewed journals and conferences
- Ability to code in multiple languages and deep learning frameworks: Python, MATLAB, R, Pytorch, Keras, Chainer, ChainerRL/PFRL
- Successfully collaborated with ~15 colleagues and mentored ~7 students from diverse backgrounds

TECHNICAL SKILLS

Machine Learning: Deep Learning, Deep Reinforcement Learning, Generative Modelling, Computer Vision
Programming Languages and Data Analysis: Python, Pytorch, Chainer, Keras, MATLAB, R
Engineering Simulation: SolidWorks, SolidThinking INSPIRE, MotionSolve
Miscellaneous: LaTeX, GitHub, Shell Scripting

EDUCATION

Iowa State University, Ames, IA **August 2017-December 2021**
Doctor of Philosophy, Ph.D., Mechanical Engineering

Iowa State University, Ames, IA **January 2012-December 2016**
Bachelor of Science, B.S., Mechanical Engineering

EXPERIENCE

Self-Aware Complex Systems Laboratory, Iowa State University, Ames, IA **August 2017-Present**
Machine Learning Graduate Research Assistant

- Developed methods to identify vulnerabilities and robustify reinforcement learning algorithms against adversarial attacks for secure deployment
- Designed novel data-efficient generative models for material design applications that reduces data generation cost by up to five times
- Formulated a deep reinforcement learning framework for inverse design of microfluidic devices that facilitate efficient exploration of the design space.
- Performed system identification & modeling of an experimental testbed vehicle to enable downstream development of autonomous driving systems
- Mentored 4 graduate, 1 undergraduate, and 2 high-school students

Lawrence Livermore National Laboratory, Livermore, CA **May 2019-August 2019**
Computer Vision Intern

- Developed computer vision algorithms to predict the onset of clogs and defects in additive manufacturing systems for accelerated large-scale experimentation and productions
- Curated a publicly released labeled video dataset of additive manufacturing processes for deep learning applications
- Explored methods to design an interactive data visualization system

Department of Mechanical Engineering, Iowa State University, Ames, IA **August 2017-May 2018**
Engineering Instrumentation Graduate Teaching Assistant

- Led 5, 3-hour weekly laboratory sessions on engineering measurement devices and data acquisition methods for ~100 students
- Developed and graded homework assignments and projects
- Proctored exams to monitor the academic honesty and integrity of students

Altair Engineering, Malaysia **March 2017-August 2017**
Application Engineer

- Conducted software training sessions for data analytics, multi-body dynamics, and controls simulation systems for ~15 engineers and technicians
- Performed simulations of hydraulic control systems used in agricultural machinery for benchmark case studies
- Implemented and deployed a remote access electronic door system using Carriots IoT platform

Claussen Laboratory, Iowa State University, Ames, IA **January 2016-December 2016**
Nanotechnology Undergraduate Research Assistant

- Designed and fabricated microfluidic devices for low-cost, in-situ testing of ammonia in soil
- Optimized geometry of planar electrodes to increase the sensitivity of biosensors
- Conducted literature survey on state-of-the-art methods for ammonium sensing

Department of Mechanical Engineering, Iowa State University, Ames, IA **January 2015-May 2016**
Fluid Mechanics Undergraduate Teaching Assistant

- Planned and graded homework assignments and projects for ~ 50 undergraduate student while adhering to a standard rubric
- Held weekly 2-hour review sessions to assist students in the understanding of course material

Material Science Undergraduate Tutor

- Facilitated weekly tutoring sessions with 4 - 5 undergraduate students
- Developed personalized study plans to ensure individual student's success

LEADERSHIP SKILLS AND SERVICE EXPERIENCE

Young Engineers and Scientist Program, **Iowa State University, Ames, IA** **May 2018-August 2018**
Mentor

- Mentored 2 high-school students to provide exposure to research and careers in STEM

SELECT PUBLICATIONS (4 of 11 publications)

- **X. Y. Lee**, Y. Esfandiari, K.L. Tan, S. Sarkar, Query-based Targeted Action-Space Adversarial Policies on Deep Reinforcement Learning Agents, *NeurIPS Deep RL Workshop, 2020. International Conference on Cyber-Physical Systems (ICCPS), 2021*
- **X. Y. Lee**, S. Ghadai, K. L. Tan, C. Hegde, and S. Sarkar. Spatiotemporally constrained action space attacks on deep reinforcement learning agents. *In AAAI, pages 4577–4584, 2020*
- **X. Y. Lee**, S. Saha, S. Sarkar, and B. Giera. Automated detection of part quality during two-photon lithography via deep learning. *Additive Manufacturing, 36:101444, 2020*
- **X. Y. Lee**, A. Balu, D. Stoecklein, B. Ganapathysubramanian, and S. Sarkar. A case study of deep reinforcement learning for engineering design: Application to microfluidic devices for flow sculpting. *Journal of Mechanical Design, 141(11), 2019*

SELECT HONORS/GRANTS (1 of 4 honors/awards)

- William and Virginia Binger Research Excellence Award ($500) **March 2020**

PROFESSIONAL ASSOCIATIONS

American Society of Mechanical Engineering **–** Member **2019-Present**

Association for Advancement in Artificial Intelligence - Member **2019-Present**